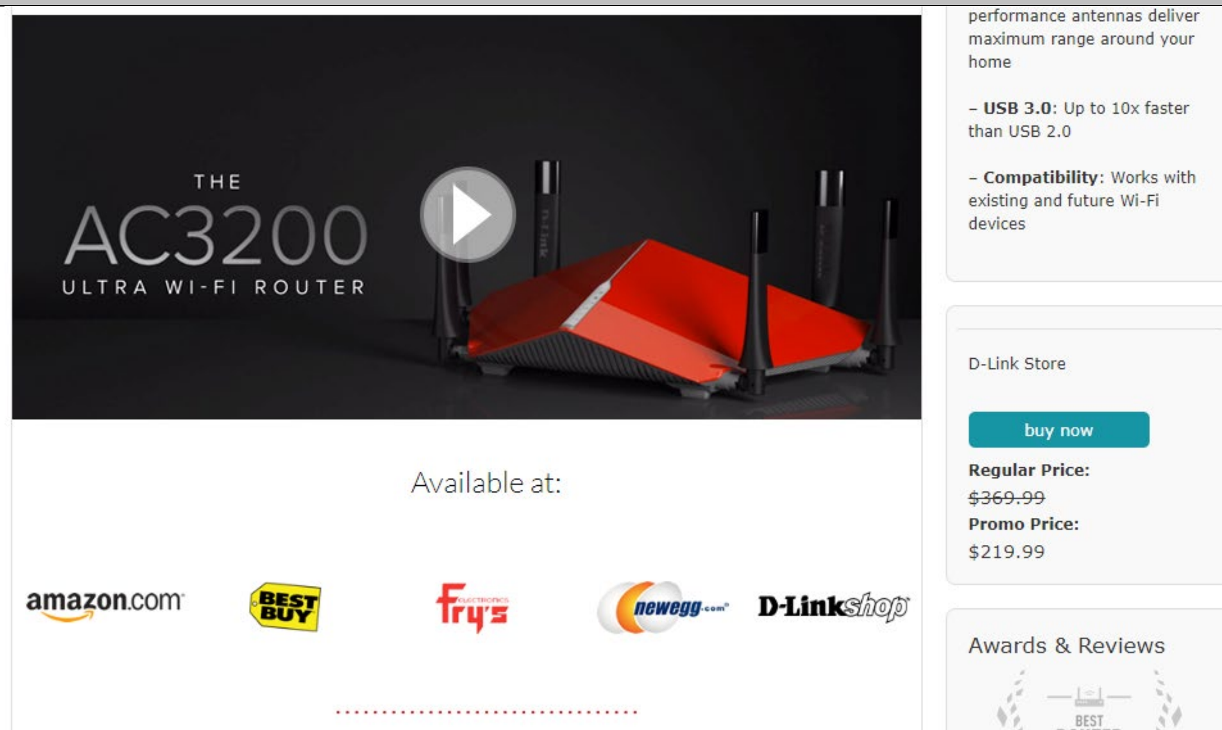
EXHIBIT 6

Exhibit 6: U.S. Patent No. 9,313,065

Claim 1	Identification
1[pre] A method of transmitting symbols using Orthogonal Frequency Division Multiplexing, OFDM, frames at an OFDM transmitter having at least two transmitting antennas, the OFDM frames having a time domain and a frequency domain, each OFDM frame comprising a plurality of OFDM symbols in the time domain, and a plurality of sub-carriers in the frequency domain, the method comprising the steps of:	To the extent the preamble is limiting, D-Link-branded devices, such as the D-Link AC3200 Ultra Wi-Fi Modem Router, implement a method of transmitting symbols using Orthogonal Frequency Division Multiplexing, OFDM, frames at an OFDM transmitter having at least two transmitting antennas, the OFDM frames having a time domain and a frequency domain, each OFDM frame comprising a plurality of OFDM symbols in the time domain, and a plurality of sub-carriers in the frequency domain, the method comprising the steps below. For example, the D-Link AC3200 Ultra Wi-Fi Modem Router uses an OFDM transmitter having at least two transmitting antennas.

Claim 1	Identification
	 https://web.archive.org/web/20180402203225/http:/us.dlink.com/products/connect/ac3200-ultra-wi-fi-router (April 2018) For example, the OFDM frames have a time domain and a frequency domain, each OFDM frame comprising a plurality of OFDM symbols in the time domain, and a plurality of sub-carriers in the frequency domain.

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<tr><th>Claim 1</th><th>Identification</th></tr>
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20. High Throughput (HT) PHY specification

20.1 Introduction

20.1.1 Introduction to the HT PHY

Clause 20 specifies the PHY entity for a high throughput (HT) orthogonal frequency division multiplexing (OFDM) system.

In addition to the requirements found in Clause 20, an HT STA shall be capable of transmitting and receiving frames that are compliant with the mandatory PHY specifications defined as follows:

— In Clause 18 when the HT STA is operating in a 20 MHz channel width in the 5 GHz band

— In Clause 17 and Clause 19 when the HT STA is operating in a 20 MHz channel width in the 2.4 GHz band

The HT PHY is based on the OFDM PHY defined in Clause 18, with extensibility up to four spatial streams, operating in 20 MHz bandwidth. Additionally, transmission using one to four spatial streams is defined for operation in 40 MHz bandwidth. These features are capable of supporting data rates up to 600 Mb/s (four spatial streams, 40 MHz bandwidth).

The HT PHY data subcarriers are modulated using binary phase shift keying (BPSK), quadrature phase shift keying (QPSK), 16-quadrature amplitude modulation (16-QAM), or 64-QAM. Forward error correction (FEC) coding (convolutional coding) is used with a coding rate of 1/2, 2/3, 3/4, or 5/6. LDPC codes are added as an optional feature.

Other optional features at both transmit and receive sides are 400 ns short guard interval (GI), transmit beamforming, HT-greenfield format, and STBC.

An HT non-AP STA shall support all equal modulation (EQM) rates for one spatial stream (MCSs 0 to 7) using 20 MHz channel width. An HT AP shall support all EQM rates for one and two spatial streams (MCSs 0 to 15) using 20 MHz channel width.

The maximum HT PSDU length is 65 535 octets.

802.11 (2012)

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<tr><th>Claim 1</th><th>Identification</th></tr>
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IEEE 11n/ac Spec.

<table>
<tr><th>Protocol</th><th>Number of
Transmit Chains (NTX)</th><th>Data Rate / MCS</th></tr>
<tr><td>802.11n (HT20)</td><td>3</td><td>MCS 0-23</td></tr>
<tr><td>802.11n (HT40)</td><td>3</td><td>MCS 0-23</td></tr>
<tr><td>802.11ac (VHT20)</td><td>3</td><td>MCS 0-9/Nss1-3</td></tr>
<tr><td>802.11ac (VHT40)</td><td>3</td><td>MCS 0-9/Nss1-3</td></tr>
<tr><td>802.11ac (VHT80)</td><td>3</td><td>MCS 0-9/Nss1-3</td></tr>
<tr><td colspan="3">Note 1: IEEE Std. 802.11n modulation consists of HT20 and HT40 (HT: High Throughput).
Then EUT support HT20 and HT40.
Note 2: IEEE Std. 802.11ac modulation consists of VHT20, VHT40, VHT80 and VHT160 (VHT: Very High Throughput). Then EUT support VHT20, VHT40 and VHT80.
Note 3: Modulation modes consist of below configuration:
HT20/HT40: IEEE 802.11n, VHT20/VHT40/VHT80: IEEE 802.11ac</td></tr>
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802.11 (2012)

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Claim 1	Identification
	p) Map each of the complex numbers in each of the N_{ST} subcarriers in each of the OFDM symbols in each of the N_{STS} space-time streams to the N_{TX} transmit chain inputs. For direct-mapped operation, $N_{TX} = N_{STS}$, and there is a one-to-one correspondence between space-time streams and transmit chains. In this case, the OFDM symbols associated with each space-time stream are also associated with the corresponding transmit chain. Otherwise, a spatial mapping matrix associated with each OFDM subcarrier, as indicated by the EXPANSION_MAT parameter of the TXVECTOR, is used to perform a linear transformation on the vector of N_{STS} complex numbers associated with each subcarrier in each OFDM symbol. This spatial mapping matrix maps the vector of N_{STS} complex numbers in each subcarrier into a vector of N_{TX} complex numbers in each subcarrier. The sequence of N_{ST} complex numbers associated with each transmit chain (where each of the N_{ST} complex numbers is taken from the same position in the N_{TX} vector of complex numbers across the N_{ST} subcarriers associated with an OFDM symbol) constitutes an OFDM symbol associated with the corresponding transmit chain. For details, see 20.3.11.11. Spatial mapping matrices may include cyclic shifts, as described in 20.3.11.11.2. 802.11 (2012) at 20.3.4
1[a] transmitting, on an OFDM symbol, pilot symbols corresponding to the first antenna using a scattered pattern; and	D-Link-branded devices, such as the D-Link AC3200 Ultra Wi-Fi Modem Router, transmit, on an OFDM symbol, pilot symbols corresponding to the first antenna using a scattered pattern:

<table>
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20.3.11.10 Pilot subcarriers

For a 20 MHz transmission, four pilot tones shall be inserted in the same subcarriers used in Clause 18, i.e., in subcarriers −21, −7, 7, and 21. The pilot sequence for the n^{th} symbols and $i_{STS}{}^{\text{th}}$ space-time stream shall be as shown in Equation (20-54).

$$\begin{aligned} P^{-28,28}_{(i_{STS},n)} = \{&0, 0, 0, 0, 0, 0, 0, \Psi^{(N_{STS})}_{i_{STS}, n \oplus 4}, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, \Psi^{(N_{STS})}_{i_{STS}, (n+1) \oplus 4}, 0, 0, 0, 0, 0, 0, 0, \\ &0, 0, 0, 0, 0, 0, \Psi^{(N_{STS})}_{i_{STS}, (n+2) \oplus 4}, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, \Psi^{(N_{STS})}_{i_{STS}, (n+3) \oplus 4}, 0, 0, 0, 0, 0, 0, 0\} \end{aligned} \quad (20\text{-}54)$$

For a 40 MHz transmission (excluding MCS 32; see 20.3.11.11.5), pilot signals shall be inserted in subcarriers −53, −25, −11, 11, 25, and 53. The pilot sequence for symbol n and space-time stream i_{STS} shall be as shown in Equation (20-55).

$$\begin{aligned} P^{-58,58}_{(i_{STS},n)} = \{&0, 0, 0, 0, 0, \Psi^{(N_{STS})}_{i_{STS}, n \oplus 6}, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, \\ &0, 0, \Psi^{(N_{STS})}_{i_{STS}, (n+1) \oplus 6}, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, \Psi^{(N_{STS})}_{i_{STS}, (n+2) \oplus 6}, 0, 0, 0, 0, 0, 0, 0, 0, 0, \\ &0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, \Psi^{(N_{STS})}_{i_{STS}, (n+3) \oplus 6}, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, \Psi^{(N_{STS})}_{i_{STS}, (n+4) \oplus 6}, \\ &0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, \Psi^{(N_{STS})}_{i_{STS}, (n+5) \oplus 6}, 0, 0, 0, 0, 0\} \end{aligned} \quad (20\text{-}55)$$

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<tr><td>1[b] transmitting, on the OFDM symbol, pilot symbols corresponding to the second antenna using the scattered pattern, wherein the pilot symbols for the first antenna correspond to a first code</td><td>D-Link-branded devices, such as the D-Link AC3200 Ultra Wi-Fi Modem Router, transmit, on the OFDM symbol, pilot symbols corresponding to the second antenna using the scattered pattern, wherein the pilot symbols for the first antenna correspond to a first code and the pilot symbols for the second antenna correspond to a second code:</td></tr>
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<table>
<tr><th>Claim 1</th><th>Identification</th></tr>
<tr><td>and the pilot symbols for the second antenna correspond to a second code.</td><td>

20.3.11.10 Pilot subcarriers

For a 20 MHz transmission, four pilot tones shall be inserted in the same subcarriers used in Clause 18, i.e., in subcarriers −21, −7, 7, and 21. The pilot sequence for the n^{th} symbols and $i_{STS}{}^{th}$ space-time stream shall be as shown in Equation (20-54).

$$P_{(i_{STS},n)}^{-28,28} = \{0, 0, 0, 0, 0, 0, 0, \Psi_{i_{STS}, n \oplus 4}^{(N_{STS})}, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, \Psi_{i_{STS}, (n+1) \oplus 4}^{(N_{STS})}, 0, 0, 0, 0, 0, 0, 0, \\ 0, 0, 0, 0, 0, 0, \Psi_{i_{STS}, (n+2) \oplus 4}^{(N_{STS})}, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, \Psi_{i_{STS}, (n+3) \oplus 4}^{(N_{STS})}, 0, 0, 0, 0, 0, 0, 0\} \quad (20\text{-}54)$$

For a 40 MHz transmission (excluding MCS 32; see 20.3.11.11.5), pilot signals shall be inserted in subcarriers −53, −25, −11, 11, 25, and 53. The pilot sequence for symbol n and space-time stream i_{STS} shall be as shown in Equation (20-55).

$$P_{(i_{STS},n)}^{-58,58} = \{0, 0, 0, 0, 0, \Psi_{i_{STS}, n \oplus 6}^{(N_{STS})}, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, \\ 0, 0, \Psi_{i_{STS}, (n+1) \oplus 6}^{(N_{STS})}, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, \Psi_{i_{STS}, (n+2) \oplus 6}^{(N_{STS})}, 0, 0, 0, 0, 0, 0, 0, 0, 0, \\ 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, \Psi_{i_{STS}, (n+3) \oplus 6}^{(N_{STS})}, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, \Psi_{i_{STS}, (n+4) \oplus 6}^{(N_{STS})}, \\ 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, \Psi_{i_{STS}, (n+5) \oplus 6}^{(N_{STS})}, 0, 0, 0, 0, 0\} \quad (20\text{-}55)$$

802.11 (2012)
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where $n \oplus a$ indicates symbol number modulo integer a and the patterns $\Psi_{i_{STS},n}^{(N_{STS})}$ are defined in Table 20-19 and Table 20-20.
NOTE—For each space-time stream, there is a different pilot pattern, and the pilot patterns are cyclically rotated over symbols.
The basic patterns are also different according to the total number of space-time streams for the packet.
Table 20-19—Pilot values for 20 MHz transmission
<table>
<tr><th>N_{STS}</th><th>i_{STS}</th><th>$\Psi_{i_{STS},0}^{(N_{STS})}$</th><th>$\Psi_{i_{STS},1}^{(N_{STS})}$</th><th>$\Psi_{i_{STS},2}^{(N_{STS})}$</th><th>$\Psi_{i_{STS},3}^{(N_{STS})}$</th></tr>
<tr><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>–1</td></tr>
<tr><td>2</td><td>1</td><td>1</td><td>1</td><td>–1</td><td>–1</td></tr>
<tr><td>2</td><td>2</td><td>1</td><td>–1</td><td>–1</td><td>1</td></tr>
<tr><td>3</td><td>1</td><td>1</td><td>1</td><td>–1</td><td>–1</td></tr>
<tr><td>3</td><td>2</td><td>1</td><td>–1</td><td>1</td><td>–1</td></tr>
<tr><td>3</td><td>3</td><td>–1</td><td>1</td><td>1</td><td>–1</td></tr>
<tr><td>4</td><td>1</td><td>1</td><td>1</td><td>1</td><td>–1</td></tr>
<tr><td>4</td><td>2</td><td>1</td><td>1</td><td>–1</td><td>1</td></tr>
<tr><td>4</td><td>3</td><td>1</td><td>–1</td><td>1</td><td>1</td></tr>
<tr><td>4</td><td>4</td><td>–1</td><td>1</td><td>1</td><td>1</td></tr>
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</table>

Claim 1	Identification

Table 20-20—Pilots values for 40 MHz transmission (excluding MCS 32)

N_{STS}	i_{STS}	$\Psi^{(N_{STS})}_{i_{STS},0}$	$\Psi^{(N_{STS})}_{i_{STS},1}$	$\Psi^{(N_{STS})}_{i_{STS},2}$	$\Psi^{(N_{STS})}_{i_{STS},3}$	$\Psi^{(N_{STS})}_{i_{STS},4}$	$\Psi^{(N_{STS})}_{i_{STS},5}$
1	1	1	1	1	–1	–1	1
2	1	1	1	–1	–1	–1	–1
2	2	1	1	1	–1	1	1
3	1	1	1	–1	–1	–1	–1
3	2	1	1	1	–1	1	1
3	3	1	–1	1	–1	–1	1
4	1	1	1	–1	–1	–1	–1
4	2	1	1	1	–1	1	1
4	3	1	–1	1	–1	–1	1
4	4	–1	1	1	1	–1	1

Id.